

Serial No. 09/783,035
Docket No. F01-243-USdiv

2

AMENDMENTS TO THE CLAIMS

- 1-17. (Canceled)
18. (Withdrawn) A semiconductor light emitting device comprising:
an n-type clad layer consisting of a gallium nitride based compound semiconductor;
an active layer consisting of a gallium nitride based compound semiconductor, said active layer being made from a material having a band gap energy smaller than that of said n-type clad layer;
a p-type clad layer consisting of a gallium nitride based compound semiconductor, said p-type clad layer being made from a material having a band gap energy greater than that of said active layer, and sandwiching said active layer accompanying with said n-type clad layer.
19. (Withdrawn) A semiconductor light emitting device comprising:
a substrate; and
GaN-type compound semiconductor layers stacked on the substrate, the GaN-type layers including:
at least one active layer,
at least one n-type layer, and
at least one p-type layer;
wherein a band gap energy of the one n-type layer is smaller than a band gap energy of the one p-type layer.
20. (Canceled)
21. (Canceled)
22. (Previously Presented) A method for producing a light-emitting semiconductor device of

Serial No. 09/783,035

3

Docket No. F01-243-USdiv

a group III nitride compound, comprising:

forming an N-layer of an N-type conduction, said N-layer comprising gallium nitride;

forming an emission layer of a group III nitride compound semiconductor satisfying the formula, $Al_{x1}Ga_{y1}In_{1-x1-y1}N$, where $0 \leq x1 \leq 1$, $0 \leq y1 \leq 1$, and $0 \leq x1+y1 \leq 1$, on said N-layer;

forming a P-layer of a P-type conduction, on said emission layer, said P-layer comprising aluminum gallium nitride satisfying the formula, $Al_{x2}Ga_{1-x2}N$, where $0 < x2 < 1$; and

forming a contact layer of a P-type conduction, on said P-layer, said contact layer comprising gallium nitride.

23. (Previously Presented) The method for producing a light-emitting semiconductor device according to claim 22, wherein said emission layer is doped with acceptor and donor impurities.

24. (Previously Presented) The method for producing a light-emitting semiconductor device according to claim 22, wherein said contact layer of said P-type conduction is formed between said P-layer and an electrode.

25. (Previously Presented) The method for producing a light-emitting semiconductor device according to claim 22, further comprising:

forming an electrode contacting said contact layer.

26. (Previously Presented) A method of producing a light-emitting semiconductor device of a group III nitride compound, comprising:

forming an N-layer of an N-type conduction, said N-layer comprising gallium nitride;

forming an emission layer of a group III nitride compound semiconductor satisfying the formula, $Al_{x1}Ga_{y1}In_{1-x1-y1}N$, where $0 \leq x1 \leq 1$, $0 \leq y1 \leq 1$ and $0 \leq x1+y1 \leq 1$, on said N-layer;

forming a P-layer of a P-type conduction, on said emission layer, said P-layer comprising aluminum gallium nitride satisfying the formula, $Al_{x2}Ga_{1-x2}N$, where $0 < x2 < 1$;

forming a contact layer of a P-type conduction, on said P-layer, said contact layer

Serial No. 09/783,035
Docket No. F01-243-USdiv

4

comprising gallium nitride; and

doping Si into said N-layer and Mg into said P-layer, so that a potential barrier of a valence band of said N-layer is lower than a potential barrier of a conduction band of said P-layer during conduction.